#05612 RP-1600V

USER'S MANUAL

16-Port 10/100Mbps Fast Ethernet Switch

16-Port 10/100Mbps Fast Ethernet Switch with 1 Fiber port

USER'S GUIDE

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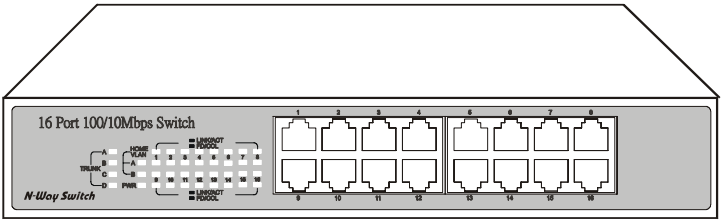
1 UNPACKING INFORMATION

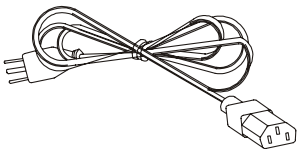
Thank you for purchasing this Switch. Before continuing, please check the contents of the product package. This product package should contain the following items:

- One (1) 16-Port Switch
- One (1) Power Cord
- Four (4) Rubber Feet (for desktop placement)
- One (1) Rackmount Kit (optional)
- This User's Guide

If anything is missing, please contact your place of purchase.



16-Port Switch



Power Cord

Rubber Feet

Rackmount Kit (optional)

User's Guide

2 PRODUCT INTRODUCTION

2.1 Models

This Switch is a multi-speed, versatile network device combining both Copper and Fiber ports under the same hood.

The number and types of ports for this Switch are listed below.

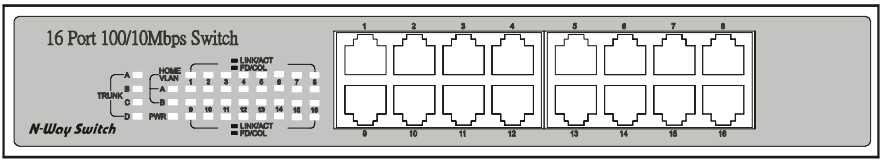
Models	100BASE-TX / 10BASE-T port	100BASE-FX port
16-Port switch	Sixteen (16)	N/A
16-Port switch with 1 Fiber port	Fifteen (15)	One (1)

Note: The last RJ-45 connector on 16-Ports (with One (1) Fiber port) switch is N/A (not available).

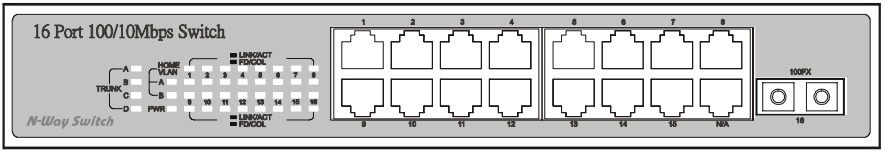
2.2 KEY FEATURES

- Independent bandwidth for each port.
- 10/100Mbps TP ports with Auto-Negotiation supported.
- Bridging capability for 100Mbps and 10Mbps segments.
- Provides Store-and-Forward forwarding scheme.
- Auto MDI/MDIX function supported.
- IEEE 802.3x Flow-Control supported for Full-Duplex operation.
- Back-Pressure Flow-Control supported for Half-Duplex operation.
- 4M bits Buffer Memory.
- 8K MAC Address Table.
- Supports QoS function on each port, based on 802.1p/802.1q VLAN Tag priority and TCP/IP Header's TOS/DS.
- Four (4) Trunk groups supported.
- Aging function supported, the aging time is about 300 sec.
- Broadcast Storm control supported.
- Supports Port-Based Home VLAN — Allow home networks to share a common server or router.
- Desktop size with rack mounting capability.

2.3 The Front Panel



16-Port Switch



16-Port Switch with 1 Fiber port

2.3.1 Port Speeds

10/100Mbps TP ports

Each 10/100Mbps TP port provides an Auto-Negotiation function and an Auto-Crossover (Auto-MDI/MDIX) function that senses for the attached device's maximum operating speed and automatically sets the Switch to operate at that speed. Each TP port uses RJ-45 connector that allows network TP cables to be easily attached or removed. Users only need to connect a network device into any TP port and the Switch will do the rest.

2.3.2 Cabling

10Mbps – Category 3, 4, or 5 TP cabling can be used for transmitting data at 10Mbps or 20Mbps bandwidth on 10BASE-T networks.

100Mbps – Only Category 5 TP cabling can be used for transmitting data at 100Mbps or 200Mbps bandwidth on 100BASE-TX networks.

Port Type	Cable Type	Connector
10BASE-T	Category 3, 4 or 5 TP	RJ-45
100BASE-TX	Category 5 TP	RJ-45
100BASE-FX	62.5/125 μ m multimode fiber cable	SC

Note: Category 5 TP cable should be used whenever installing new TP cabling.

2.3.3 Status LEDs

This Switch comes with a complete range of LEDs. The table below lists each LED's name, color and a brief description of its function.

- One (1) for power On/Off.
- One (1) per port for Link/Activity.

· One (1) per port for Full-Duplex/Collision.
· Four (4) for TRUNK Groups status.
· Two (2) for Home VLAN status.

Name		Color	Function
Pwr		Green	Lit: Power "On"
LINK/ACT		Green	Lit: When the port has a valid physical connection (Link) with another device. Blinks: When the port is sending or receiving data (Activity).
FD/COL		Amber	Lit: When the port is set to Full-Duplex mode. Blinks: When a collision is detected, in Half-Duplex mode.
TRUNK	A	Green	Lit: TRUNK A Group Enable (Port#1, #2, #9, #10 are a TRUNK Port) Blink: When the TRUNK Group has a port link **Failure** with another device.
	B	Green	Lit: TRUNK B Group Enable (Port#3, #4, #11, #12 are a TRUNK Port) Blinks: When the TRUNK Group has a port link **Failure** with another device.
	C	Green	Lit: TRUNK C Group Enable (Port #5, #6, #13, #14 are a TRUNK Port) Blinks: When the TRUNK Group has a port link **Failure** with another device.
	D	Green	Lit: TRUNK D Group Enable (Port #7, #8, #15, #16 are a TRUNK Port) Blinks: When the TRUNK Group has a port link **Failure** with another device.
Home VLAN	A	Amber	Lit: Support 14 VLANs (Port#1－#7, #9-#15) with 2 overlapping ports (Port#8, #16) topology
	B	Amber	Lit: Support 15 VLANs (Port#1－#15) with 1 overlapping port (Port#16) topology

We provide Four (4) LEDs to indicate the TRUNK status.
The TRUNK LED will be lit on when the trunk is enable, it will blink when any physical port link failures occur within the enabled trunk port.
If the TRUNK LED blinks during the normal operation, please check the trunk group ports link status.

2.4 The Rear Panel

16-Port Switch

16-Port Switch with 1 Fiber port

2.4.1 Power Socket

The Power Socket is designed to be used with the power cord included in the product package.

· Attach the female end of the cord to the power connector on the back panel.

· Attach the male end of the cord to a grounded power outlet.

Note: To reset the switch, Remove the power cord and re-attach it .

· The switch must be reset when the MAC Address table needs to be rebuilt.

· The switch must be reset when the configurations (on real panel) are changed.

2.4.2 DIP-Switch

This Switch provides DIP-Switches setting to configuration, the configuration setting as below:

a. Home VLAN

We have provided two DIP-Switches for the Home VLAN setting.

	Left side DIP-Switch	Right side DIP-Switch
SW up	Home VLAN Disable	Home VLAN TYPE A
SW down	Home VLAN Enable	Home VLAN TYPE B

Home VLAN TYPE A: Select 14 VLANs (port#1－#7, #9－#15) with two overlapping ports (port#8, #16) topology. (VLAN1: port#1, #8, #16; VLAN2: port#2, #8, #16; VLAN3: port#3, #8, #16, …; VLAN14: port#15, #8, #16)

Home VLAN TYPE B: Select 15 VLANs(port#1－#15) with one overlapping port (port#16) topology. (VLAN1: port#1, #16; VLAN2: port#2, #16; …; VLAN15: port#15, #16)

This function for network topology security configuration. When the Port-Based security function is enabled, the 16-Ports Switch can be configured as 14 (or 15) individual VLANs that share the same two (or one) overlapping port(s). This 14 VLANs or 15 VLANs topology is useful to allow home networks to share common servers or routers, this function can be used on Fiber To The Home (FTTH) or Ethernet To The Home (ETTH) application.

Note: Only when the left side DIP-Switch move to “ON”, the function of the right side DIP-Switch would be active.

b. TRUNK

We have support Four DIP-Switches for the TRUNK Port setting.

	A	B	C	D
SW up	TRUNK A Disable	TRUNK B Disable	TRUNK C Disable	TRUNK D Disable
SW down	TRUNK A Enable	TRUNK B Enable	TRUNK C Enable	TRUNK D Enable

· TRUNK A: Port#1, #2, #9, #10

· TRUNK B: Port#3, #4, #11, #12

· TRUNK C: Port#5, #6, #13, #14

· TRUNK D: Port#7, #8, #15, #16

If the trunk function enable, it can be provided 800Mbps bandwidth between two devices, it is useful to allow high bandwidth in Backbone or server connection.

Note: If the Home VLAN function is enabled, it will disable the TRUNK function setting.

c. 100FX (100BASE-FX operation mode setting) (only for the Switch w/ Fiber port)

This DIP-Switch is setting to configuration 100Mbps Half-/Full-Duplex on the Fiber port.

	Operation mode
SW up	100Mbps Half-Duplex
SW down	100Mbps Full-Duplex

Note: When the DIP-Switches configuration changes, the Switch had to be "Power Reset". Please reboot after configuration change.

2.5 Broadcast Storm Control

The Broadcast Storm Control discards broadcast frames when the number of cumulated non-unicast frames is over the threshold, in order to prevent Network Traffic congestion bringing the Network to a halt. In this Switch, each port will drop broadcast packets (Destination MAC ID is ff ff ff ff ff ff) after receiving continuous 64 broadcast packets. The counter will be reset to 0 every 800ms or when receiving any non-broadcast packets. (Destination MAC ID is not ff ff ff ff ff ff)

3 INSTALLATION

This 16-Port Switch is "Plug-&-Play". They do not require software configuration. Users can immediately use any of the features of this product simply by attaching the cables and turning on the power.

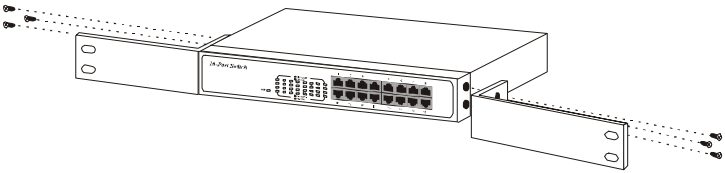
3.1 LOCATE THE SWITCH

- Attach the Four (4) rubber feet included in the product package to the bottom of the Switch, one in each corner.
- Place the Switch on a clean, flat desk or table top close to a power outlet.
- Plug in all network connections and the power cord.

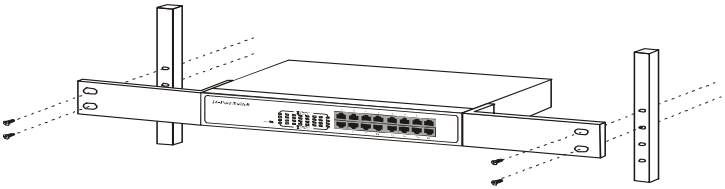
3.2 RACKMOUNT PLACEMENT

This Switch can be mounted in an EIA standard-sized 19-inch rack.

Attach One (1) rackmounting bracket on each side of the Switch's front panel with the provided screws.



Use the other provided screws to secure the Switch to the rack.



* An "Long-Ear" rackmount kit (description "Rack-02") is available as an option.

4 HELPFUL SUGGESTIONS

4.1 Prior to Installation

Before installing this Switch and connecting it to network devices, it is important to plan the network's layout. Things you should consider include:

Dedicated Bandwidth: File servers and other high-traffic hardware improve their performance if they have their own dedicated 10Mbps or 100Mbps bandwidth.

Full-Duplex: Determine which devices support Full-Duplex connections.

Fast Ethernet: Make sure rules for cable lengths and categories are followed. 100BASE-TX and 100BASE-FX have different rules for cable and distance.

Auto-Negotiation: Devices with different speeds may be easily swapped when the other end of the cable is fixed to a port with Auto-Negotiation.

Crossover Uplink: This Switch can be Uplinked to another Switch using any of the TP port.

4.2 Half- and Full-Duplex

This Switch supports both Half- and Full-Duplex modes for 10BASE-T and 100BASE-TX.

- In Half-Duplex mode data cannot be transmitted and received at the same time. Attached devices must finish transmitting data before they can receive data.
- In Full-Duplex mode data can be transmitted and received at the same time.

4.3 Auto-Negotiation

Every 10/100Mbps dual speed port on this Switch has a built-in "Auto-Negotiation" function. This technology automatically sets the best possible bandwidth as soon as a connection is established with another network device (usually at Power “On” or Reset). This capability is achieved via the Switch’s Auto-Negotiation function that automatically detects the modes and speeds the second (attached) device is capable of.

Evaluating Auto-Negotiation Capability:

If the attached device is:	This Switch Will Automatically Set Its TP Ports to Operate At:
100Mbps no Auto-Negotiation	100Mbps Bandwidth (100BASE-TX, Half-Duplex)
100Mbps with Auto-Negotiation	200Mbps Bandwidth (100BASE-TX, Full-Duplex)
10Mbps no Auto-Negotiation	10Mbps Bandwidth (10BASE-T, Half-Duplex)
10Mbps with Auto-Negotiation	20Mbps Bandwidth (10BASE-T, Full-Duplex)

Note: If the attached device is set to a fixed Forced Full-Duplex mode, it will not operate as an Auto-Negotiation device.

4.4 MAC Address Table

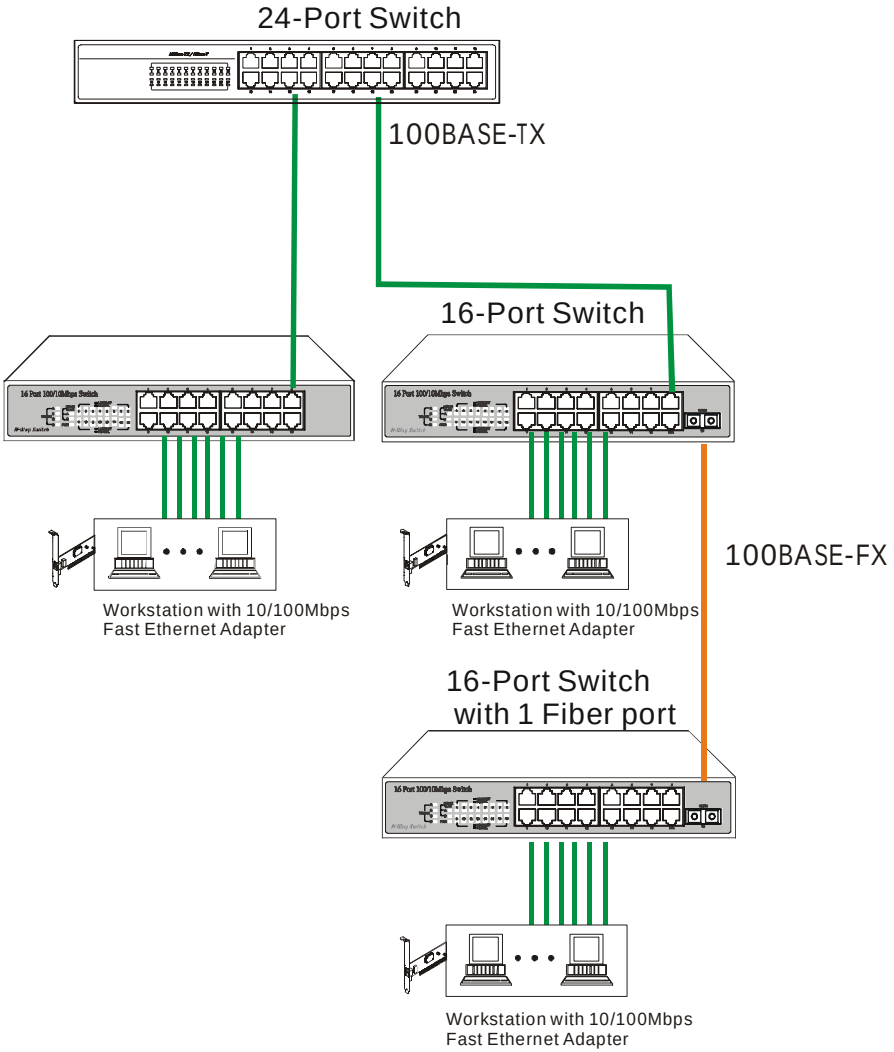
Every Ethernet data packet includes both source and destination addresses. This 6-byte ID is called the MAC (Media Access Control) Address.

The Switch can automatically learn and store MAC addresses. However, the MAC address table is volatile: it disappears when the Switch is powered “Off” or reset.

Note: When the network needs reconfiguration, we recommend turning off the power first. After all nodes have been moved, Remove the power cord and re-attach it on the back panel to rebuild the internal MAC address table.

5 Sample Application

The optimal application for this Switch is to interconnect file servers with other bandwidth-hungry workgroups, departments, and offices all with dedicated bandwidths.



6 PRODUCT SPECIFICATIONS

Models	16-Port Switch	16-Port Switch with 1 Fiber port
Standards	• IEEE 802.3u: 100BASE-TX • IEEE 802.3: 10BASE-T	• IEEE 802.3u: 100BASE-TX /FX • IEEE 802.3: 10BASE-T
Ports	• Sixteen (16) 100BASE-TX/10BASE-T	• Fifteen (15) 100BASE-TX/10BASE-T • One (1) 100BASE -FX
Media Support	• 100BASE-TX: Category 5 TP • 10BASE-T: Category 3, 4 or 5 TP	• 100BASE-TX: Category 5 TP • 10BASE-T: Category 3, 4 or 5 TP • 100BASE-FX: 62.5/125 μm Multi-Mode Fiber cable
Bandwidth	• 100BASE-TX: 200/100Mbps via Auto-Negotiation • 10BASE-T: 20/10Mbps via Auto-Negotiation	• 100BASE-TX: 200/100Mbps via Auto-Negotiation • 10BASE-T: 20/10Mbps via Auto-Negotiation • 100BASE-FX: 200/100Mbps via DIP-Switch
Forwarding/ Filtering Rate	• 148810 packets/second per port @ 100Mbps, maximum • 14881 packets/second per port @ 10Mbps, maximum	
Latency	• 8.5 μsec @100Mbps, minimum • 67 μsec @ 10Mbps, minimum	
MAC Addresses	• 8K Six (6)-byte entries maximum, Self-Learning	
Buffer Memory	• 4M bits	
Duplex Modes	• Auto-Negotiation	• Full-Duplex and Half-Duplex via DIP-switch on Fiber port • Auto-Negotiation for TP ports
Auto-MDIX	• All TP ports support Auto-MDI/MDIX function	
DIP Switches	• Two (2) for Home VLAN setting • Four (4) for TRUNK setting	• Two (2) for Home VLAN setting • Four (4) for TRUNK setting • One (1) for 100 Half/Full-Duplex (100BASE-FX)
LED Indicators	• One (1) for Power • One (1) per port for Link/ACT • One (1) per port for Full-Duplex or Collision • Two (2) for Home VLAN status • Four (4) for TRUNK Group status	
Power Supply	• Internal full range switching power supply • Input voltage: 100 ~ 240V AC +/-10%, 50/60 Hz	
Power Consumption	• 9.9W maximum	
Environment	• Operating Temperature: 0° ~ 45°C (32° ~ 113°F) • Storage Temperature: -20° ~ 70°C (-4° ~ 158°F) • Humidity: 10% ~ 90% Non-Condensing	
Certifications	• FCC Class A, CE Mark and TUV approved	
Dimensions	• 250 x 150 x 43 mm (9.8 x 5.9 x 1.7 inches)	• 250 x 150 x 43 mm (9.8 x 5.9 x 1.7 inches)

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against electromagnetic interference in a commercial environment.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE MARK WARNING

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.